

**REMARKS**

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-5, 7-9 and 11-22 are pending in the present application. No claims are amended or added by the present response.

In the outstanding Office Action, Claims 1-5, 7-9, and 11-22 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite; Claims 1-5, 7-9, and 11-13 were rejected under 35 U.S.C. §103(a) as unpatentable over Mannava (U.S. Patent No. 5,522,706) in view of Nagaoka (JP 57-193701) and in further view of Walker et al. (U.S. Patent No. 6,106,233, herein "Walker"); Claims 14-17 and 21-22 were rejected under 35 U.S.C. §103(a) as unpatentable over Mannava in view of Walker; and Claims 18-20 were rejected under 35 U.S.C. § 103(a) as unpatentable over Mannava in view of Walker, and in further view of Nagaoka.

Regarding the rejections under 35 U.S.C. § 112, second paragraph, the Office Action contends that Claims 1, 11, 14, and 15 contain claim limitations that are not clear. Specifically, regarding Claims 1 and 14, the Office Action contends that the claim feature "the axis of the slot being radial from an axial direction to the disk" is not clear as it "may be interpreted to mean at least that either that the axis of the slot is **tilted** radial from the axial direction of the disk, or is **positioned** radially outwards relative to the central axis pass-through hole." Regarding Claims 11 and 15, the Office Action

contends that the claim feature of the slots being tilted “vertically” is not clear as “the vertical direction is not clearly defined.” These contentions are respectfully traversed.

It is respectfully submitted that the record fails to establish a *prima facie* case of indefiniteness.

“The essential inquiry regarding the definiteness requirement of 35 U.S.C. § 112 is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity.” Manual of Patent Examination Procedure [hereinafter MPEP] § 2173.02 (8th Ed. 2001) (Rev. 7, July 2008). “Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

(1) the content of the particular application disclosure;

(2) the teachings of the prior art; and

(3) the claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.”

Id. The Office has the initial burden of providing some analysis as to why a recitation is “vague and indefinite.” Id.

Absent in the record is any application of the above factors expressly set forth by the MPEP. For example, the Office Action is completely silent on the issue of the content of the particular application disclosure. Instead, with respect to the feature “the axis of the slot being radial from an axial direction to the disk”, the Office Action merely concludes that the feature is indefinite because it is subject to two potential interpretations. With respect to the feature reciting the slots being tilted “vertically,” the

Office Action concludes the feature is indefinite because the vertical direction is not defined. These conclusions are not supported by any analysis of the above factors. Accordingly, it is respectfully submitted that this lack of analysis precludes the establishment of a *prima facie* case of indefiniteness.

Further, regarding claims 1 and 14, it is respectfully submitted that just because a claim feature is subject to multiple interpretations, it is not indefinite. That is, as noted in MPEP § 2173.04, “[b]readth of a claim is not to be equated with indefiniteness.”

In view of the above, it is respectfully submitted that the record fails to establish a *prima facie* case of indefiniteness of Claims 1-5, 7-9, and 11-22.

Moreover, in order to expedite prosecution, it is respectfully submitted that the content of the particular application disclosure offers clear guidance with respect to the feature “the axis of the slot being radial from an axial direction to the disk.” For example, as explained at page 7 of the specification, “the slots are tilted with respect to the axis of the disk itself in two directions, axial and vertical.” Further, the specification expressly notes the “axis of the slot of the middle side section of the disk 20, shown in figure 8.” Finally, Figure 8 depicts the axis of the slot.

Similarly, regarding Claims 11 and 15, the claims themselves provide guidance in interpreting the term “vertically.” Specifically, the claims recite the series of the slots is tilted both axially and vertically relative to axial and vertical directions of the disk. Thus, the tilt of the series of slots is discussed relative to the disk itself.

In view of the above, it is respectfully submitted that Claims 1-5, 7-9, and 11-22 are definite.

The outstanding rejections on the merits of the claims are respectfully traversed for the following reasons.

Briefly recapitulating, independent Claim 1 is directed to a disk of a disk rotor for a gas turbine. The disk includes, *inter alia*, an outer portion having a series of holes and a series of slots. Each slot has a reference point for placing a corresponding vane, and an angle between the reference point of a slot and a central point of an adjacent hole of the series of holes is between 2 and 10 sexagesimal degrees. The reference point is defined by an intersection of (i) an axis of the slot in a middle section of the disk with (ii) an extension of a side surface of the outer portion, the axis of the slot being radial from an axial direction of the disk.

In a non-limiting example, Figure 8 shows the reference point 80 as being at the intersection of axis 82 and the extension of side surface 29. Further, Figure 5 shows that the reference point 80 is also in the middle side section of disk 20. Figure 1 shows that the axis (line II-II) is radial from an axial direction of the disk.

Turning to the applied art, Mannava is directed towards laser shock peened disks with loading and locking slots for turbo machinery. More specifically, Mannava shows in Figure 1 a rotor disk 2 having plural slots 54 cut into a rim 10 of the disk 2 and plural holes 18 formed under rim 10. However, Mannava is completely silent about defining a reference point relative to a slot 54 and also about defining an angle of the reference

point relative to a hole 18 in the disk 2. Moreover, the Office Action concedes that "Mannava does not teach the specific dimension of the angle."

The outstanding Office Action, addressing similar features to those discussed above with regard to Claim 1, contends that the specific dimensions of the angle would have been an obvious matter of design choice. Specifically, the Office Action contends "applicant has not disclosed that having the specific dimension of the angle solves any stated problem or is for any particular purpose above the fact that the angle or relative position... reduces the stress concentration and it appears that the disk of Mannava would perform equally well with a shape and having the dimensions as claimed by applicant." This contention is respectfully traversed.

First, the Office Action's own admission that the application does in fact disclose that "the angle or relative position... reduces stress concentration..." is respectfully noted. This statement on its own is an admission that the angle or relative position is significant, and thus is not simply a design choice.

Second, as discussed in the specification, the angle or relative position of the slots with respect to the holes is related to mechanical and thermal stress caused by vanes during the functioning of the turbine. Specifically, page 7, second full paragraph, indicates that "[n]umerous tests and analyses have been effected which have revealed that the relative portion of the vanes with respect to the holes is extremely important." Then, on page 8, the specification explains:

With reference to FIG. 7, it can be noted that, by thus positioning the slots with respect to the holes, a sufficiently

resistant section is obtained, which allows a good resistance to cyclic stress and consequently a sufficient useful life of the component.

At the same time, having positioned the holes of the series of holes 27 in the outer portion of the disk 20, preferably with the diameter of the circumference 61 close to the diameter of the disk 20, high flexural and torsional inertia characteristics of the rotor 20 are obtained.

As the angle or position of the slots with respect to the holes is disclosed as relevant, it is respectfully submitted that the above features are not simply a matter of design choice.

Third, the outstanding Office Action states on page 6, last full paragraph, that Mannava teaches "the angle in between the reference point and the central position of the adjacent hole." However, the outstanding Office Action fails to disclose where Mannava teaches such an angle and Applicant could not find such a teaching. If such a teaching is present in the applied art, Applicant respectfully requests that the next Office Action indicates the location of such a teaching.

In fact Mannava does not teach or suggest the asserted "reference point" and it appears that the outstanding Office Action relies entirely on edited Figure 1 of Mannava as shown on page 5 of the outstanding Office Action for showing a reference point and an angle between the reference point and a central position of the adjacent hole.

In this regard, it is noted that the outstanding Office Action draws two axes through the asserted claimed reference point (not disclosed by Mannava) and the central position of the adjacent hole and from here assumes that there is an angle

between the two. However, for the clarity of the record, it is noted that Mannava does not shows these two axes and these axes are produced by the examiner to support his argument.

MPEP specifically indicates that this "procedure" is not appropriate by stating in 2125, second full paragraph, that

When the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. See *Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000).

Applicant notes that the entire foundation for the outstanding Office Action's argument that there is an angle between the reference point and the central position of the adjacent hole is based on drawings of Mannava not described as being at scale and also based on axes drawn by the examiner.

Thus, Applicant respectfully submits that the combination of drawings not to scale and added axes (that may or may not be accurate) renders the entire argument of the outstanding Office Action questionable and contrary to established MPEP practice. For this and other reasons mentioned above, it is respectfully submitted that the Mannava fails to teach or suggest the claimed angles.

Nagaoka and Walker have been considered but neither of these references cures the deficiencies of Mannava discussed above.

Therefore, Applicant respectfully submits that the applied art does not teach or suggest the claimed features.

Accordingly, in light of the above discussion, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested. If, however, there are any remaining unresolved issues that would prevent the issuance of the Notice of Allowance, the Examiner is urged to contact the undersigned at (540) 361-2601 in order to expedite prosecution of this application.

Respectfully submitted,  
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